



## N-Channel 30-V (D-S) MOSFET

PRODUCT SUMMARY		
$V_{DS}$ (V)	$r_{DS(on)}$ ( $\Omega$ )	$I_D$ (A)
30	0.077 @ $V_{GS} = 4.5$ V	3.4
	0.120 @ $V_{GS} = 2.5$ V	2.5

### FEATURES

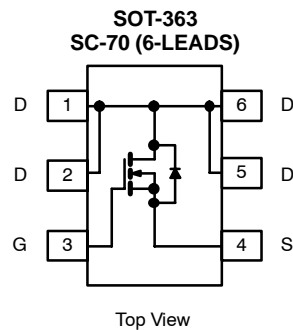
- TrenchFET® Power MOSFET: 2.5-V Rated

### APPLICATIONS

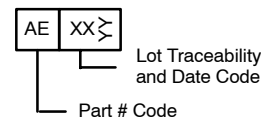
- Load Switch for Portable Applications



Product Is Completely Pb-free



Marking Code



Ordering Information: Si1402DH-T1—E3

### ABSOLUTE MAXIMUM RATINGS ( $T_A = 25^\circ\text{C}$ UNLESS OTHERWISE NOTED)

Parameter	Symbol	5 secs	Steady State	Unit	
Drain-Source Voltage	$V_{DS}$	30		V	
Gate-Source Voltage	$V_{GS}$	$\pm 12$			
Continuous Drain Current ( $T_J = 150^\circ\text{C}$ ) <sup>a</sup>	$I_D$	$T_A = 25^\circ\text{C}$	3.4	2.7	A
		$T_A = 70^\circ\text{C}$	2.7	2.2	
Pulsed Drain Current	$I_{DM}$	8			
Continuous Source Current (Diode Conduction) <sup>a</sup>	$I_S$	1.2	0.8		
Maximum Power Dissipation <sup>a</sup>	$P_D$	$T_A = 25^\circ\text{C}$	1.45	0.95	W
		$T_A = 70^\circ\text{C}$	0.94	0.6	
Operating Junction and Storage Temperature Range	$T_J, T_{stg}$	-55 to 150		$^\circ\text{C}$	

### THERMAL RESISTANCE RATINGS

Parameter	Symbol	Typical	Maximum	Unit	
Maximum Junction-to-Ambient <sup>a</sup>	$R_{thJA}$	$t \leq 5$ sec	65	85	$^\circ\text{C}/\text{W}$
		Steady State	87	130	
Maximum Junction-to-Foot (Drain)	$R_{thJF}$	40	50		

Notes

a. Surface Mounted on 1" x 1" FR4 Board.

SPECIFICATIONS ( $T_J = 25^\circ\text{C}$ UNLESS OTHERWISE NOTED)						
Parameter	Symbol	Test Condition	Min	Typ	Max	Unit
<b>Static</b>						
Gate Threshold Voltage	$V_{GS(th)}$	$V_{DS} = V_{GS}, I_D = 250\ \mu\text{A}$	0.6		1.6	V
Gate-Body Leakage	$I_{GSS}$	$V_{DS} = 0\ \text{V}, V_{GS} = \pm 12\ \text{V}$			$\pm 100$	nA
Zero Gate Voltage Drain Current	$I_{DSS}$	$V_{DS} = 30\ \text{V}, V_{GS} = 0\ \text{V}$			1	$\mu\text{A}$
		$V_{DS} = 30\ \text{V}, V_{GS} = 0\ \text{V}, T_J = 55^\circ\text{C}$			5	
On-State Drain Current <sup>a</sup>	$I_{D(on)}$	$V_{DS} \geq 5\ \text{V}, V_{GS} = 4.5\ \text{V}$	4			A
Drain-Source On-State Resistance <sup>a</sup>	$r_{DS(on)}$	$V_{GS} = 4.5\ \text{V}, I_D = 3.0\ \text{A}$		0.064	0.077	$\Omega$
		$V_{GS} = 2.5\ \text{V}, I_D = 2.0\ \text{A}$		0.095	0.120	
Forward Transconductance <sup>a</sup>	$g_{fs}$	$V_{DS} = 5\ \text{V}, I_D = 3.0\ \text{A}$		10		S
Diode Forward Voltage <sup>a</sup>	$V_{SD}$	$I_S = 1.05\ \text{A}, V_{GS} = 0\ \text{V}$		0.80	1.1	V
<b>Dynamic<sup>b</sup></b>						
Total Gate Charge	$Q_g$	$V_{DS} = 15\ \text{V}, V_{GS} = 4.5\ \text{V}, I_D = 2.0\ \text{A}$		3	4.5	nC
Gate-Source Charge	$Q_{gs}$			0.6		
Gate-Drain Charge	$Q_{gd}$			1.0		
Gate Resistance	$R_g$	$f = 1.0\ \text{MHz}$		2.4		$\Omega$
Turn-On Delay Time	$t_{d(on)}$	$V_{DD} = 15\ \text{V}, R_L = 15\ \Omega$ $I_D \cong 1\ \text{A}, V_{GEN} = 10\ \text{V}, R_g = 6\ \Omega$		5	8	ns
Rise Time	$t_r$			12	23	
Turn-Off Delay Time	$t_{d(off)}$			13	23	
Fall Time	$t_f$			7	12	
Source-Drain Reverse Recovery Time	$t_{rr}$	$I_F = 1.05\ \text{A}, di/dt = 100\ \text{A}/\mu\text{s}$		15	25	nC
Reverse Recovery Charge	$Q_{rr}$			7.5	12	

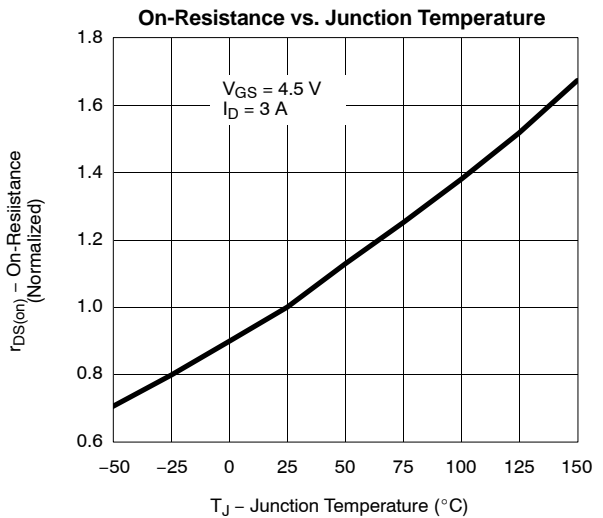
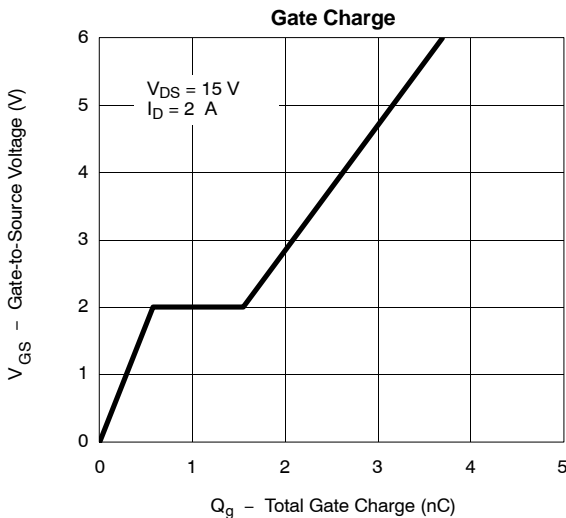
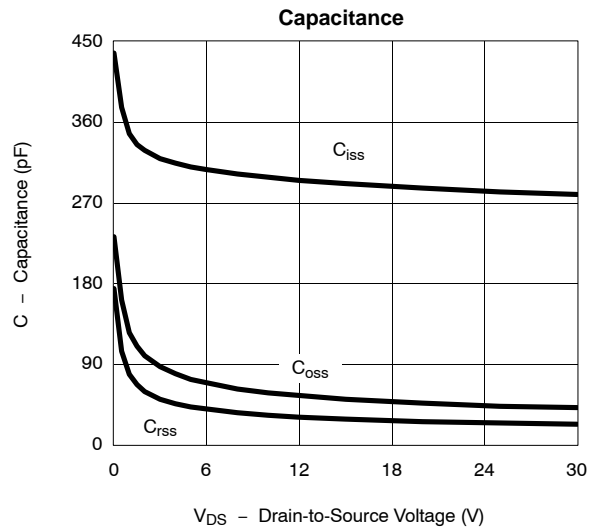
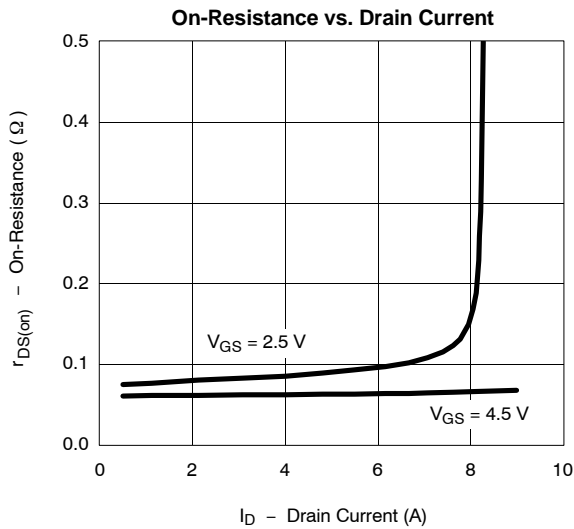
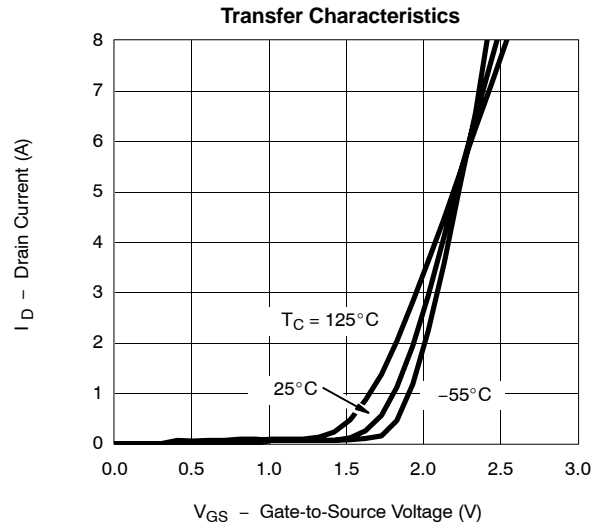
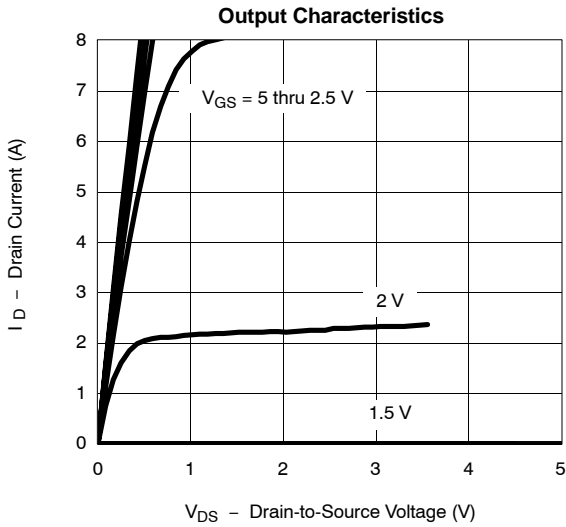
## Notes

- a. Pulse test; pulse width  $\leq 300\ \mu\text{s}$ , duty cycle  $\leq 2\%$ .  
b. Guaranteed by design, not subject to production testing.

Stresses beyond those listed under "Absolute Maximum Ratings" may cause permanent damage to the device. These are stress ratings only, and functional operation of the device at these or any other conditions beyond those indicated in the operational sections of the specifications is not implied. Exposure to absolute maximum rating conditions for extended periods may affect device reliability.

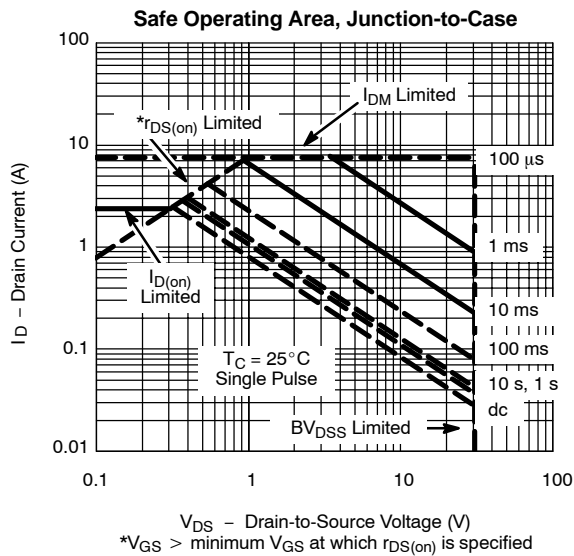
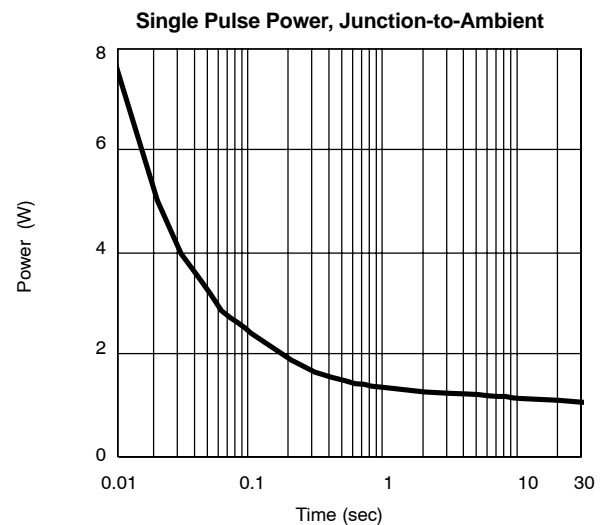
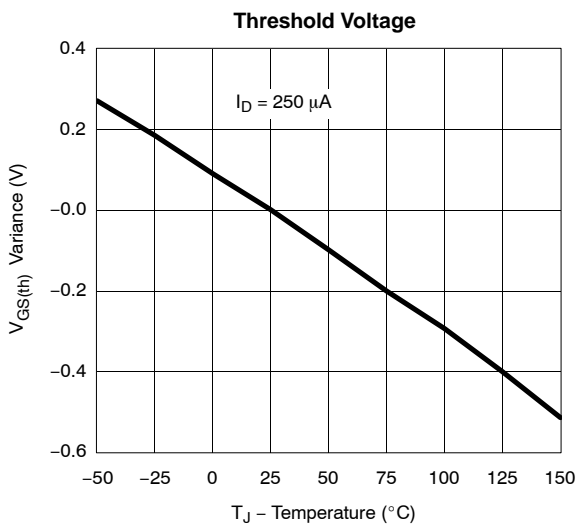
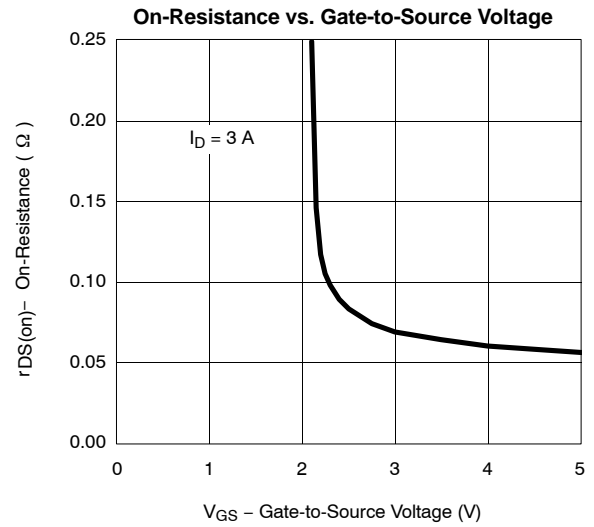
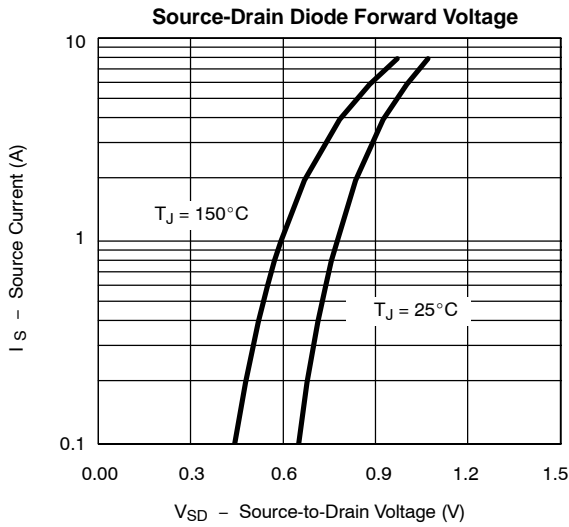


**TYPICAL CHARACTERISTICS (25°C UNLESS NOTED)**



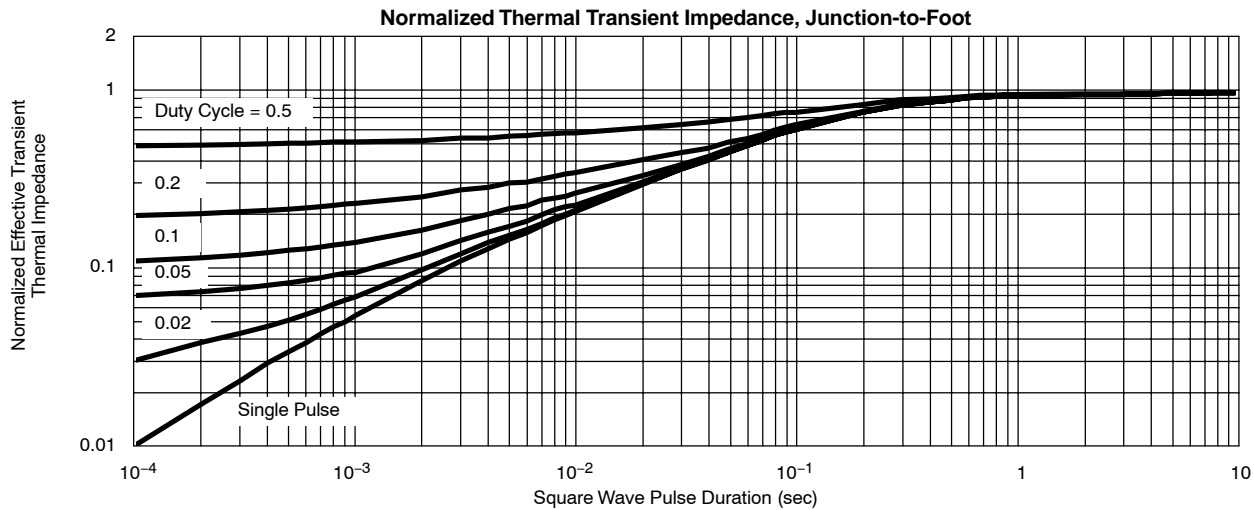
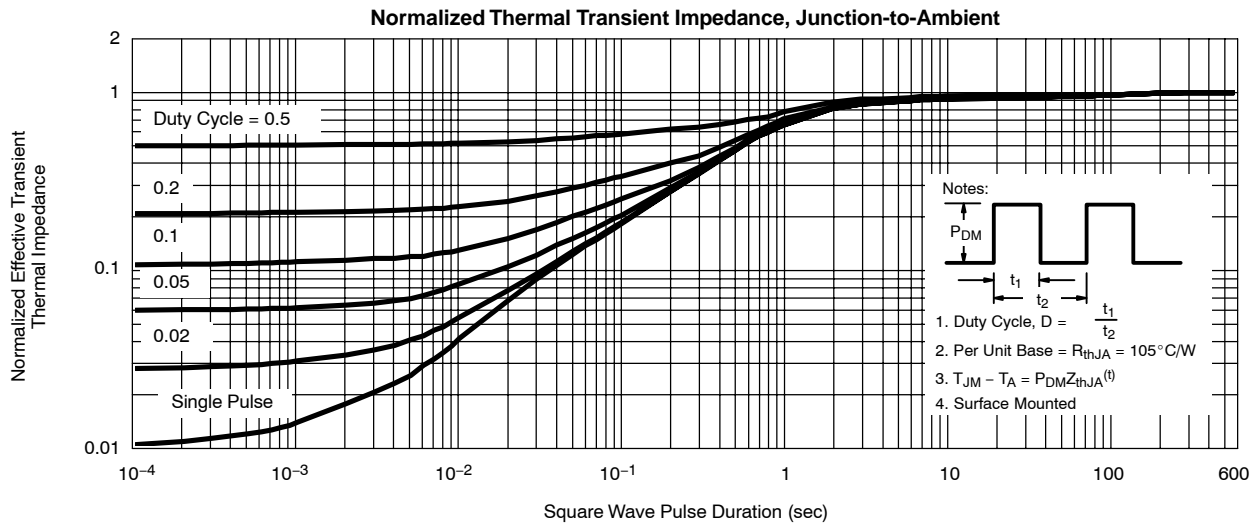


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